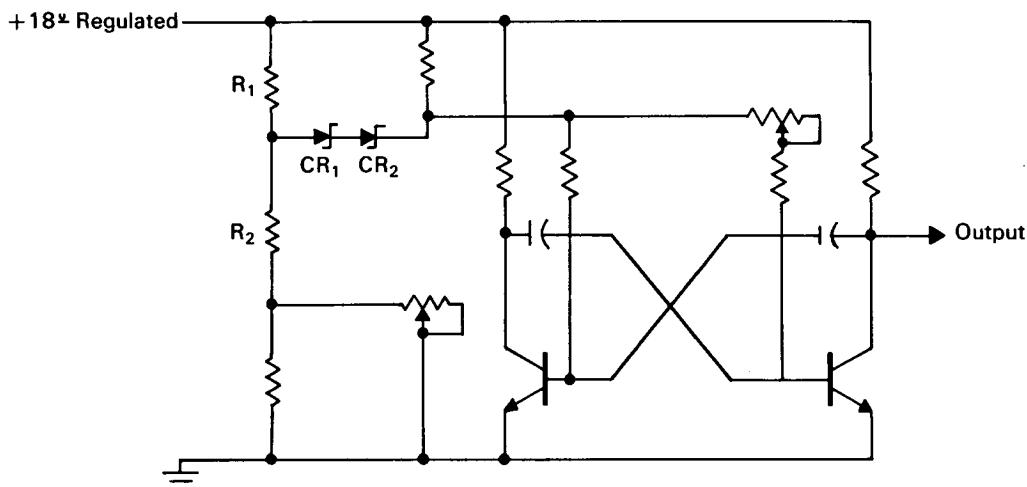


NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

Temperature-Sensitive Network Drives Astable Multivibrator



The problem: Conventional astable multivibrators exhibit frequency instability in the presence of temperature variations.

The solution: A simple network consisting of two zener diodes and five resistors provides a temperature-sensitive voltage to drive the astable multivibrator.

How it's done: The two zener diodes are referenced to a point held relatively stable at +9 volts by R_1 and R_2 which act as a conventional voltage divider. Acting together, the two zener diodes provide a voltage which, when referenced to ground, is inversely proportional to temperature because the zener diodes have a breakdown voltage that is inversely proportional to temperature. Under test this circuit yielded an output square wave at 2400 cps varying from 2398.5 to 2401.1 cps over a temperature range of -10° to $+40^{\circ}\text{C}$.

Notes:

1. With adequate shielding of the zener diodes, the circuit should exhibit an output constant to within 0.2 cps. Potting should improve regulation even further.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland, 20771
Reference: B63-10609

Patent status: NASA encourages the immediate commercial use of this invention. Inquiries about obtaining rights for its commercial use may be made to NASA Headquarters, Washington, D.C., 20546.

Source: Radio Corporation of America
under contract to
Goddard Space Flight Center (GSFC-137)